the stipes develop together as a common stipe, at the summit of which the drupelets "are placed in a starlike manner."

STANDLEY,[18] in continuing his studies of tropical American plants, under a variety of titles has described numerous new forms as follows: *Wercklea* and *Peltaea*, new genera of Malvaceae; new species in Cyperaceae (2), Amaranthaceae (18; 11 of which belong to *Iresine*), Allionaceae (3), Caesalpiniaceae (4), Mimosaceae (4), Fabaceae (6), Ebenaceae (5; 3 of which belong to *Diospyros*), and Rubiaceae (20); also new species in *Geranium* (2), *Malache* (4), *Waltheria*, *Styrax*, *Evea* (2), *Duggena*, *Arctophyllum* (3), and *Psychotria* (11).—J. M. C.

Inheritance of awns and velvet chaff.—Students of genetic problems in wheat have arrived at conflicting conclusions, owing, no doubt, to the existence of biotypes possessing diverse factorial constitutions with respect to the characters under consideration. The HOWARDS have shown[19] that the velvet chaff of wheat may be of two distinct kinds, characterized by different types of hairs. Each kind of hair is produced by a distinct Mendelian factor, and the two kinds are mingled on the glumes when both of these factors are present. Only in the absence of both velvet factors are the glumes glabrous. Selfing any hybrid in which both velvet factors are heterozygous produces a progeny consisting of 15 velvet chaff to 1 glabrous. This result has received further confirmation in a recent paper by the same authors,[20] which is devoted chiefly to the inheritance of awns. Most of the genetical studies which have been made with the latter characteristic have involved forms which are not completely awnless. The HOWARDS used, among others, completely awnless varieties, and demonstrated that two independent factors affect the extent and nature of the awning. One of these factors (*T*) produces short awns or "tips" only, which are developed most conspicuously in the distal portion of the spike, while the other (*B*) also produces short awns, which are distributed more uniformly over the spike. The combined action of both of these factors in the homozygous state is required to produce the fully bearded condition. With respect to both of these factors, the heterozygote is successfully distinguished from the homozygotes by a distinctly intermediate condition. Completely bearded wheats have the formula *TTBB*, and the completely beardless are *ttbb;* the complete ratio of forms produced in the F_2 of a cross between awned and awnless forms,

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[18] STANDLEY, PAUL C., Studies of tropical American Phanerogams. No. 2. Contrib. U.S. Nat. Herb. **18**:87–142. 1916.

[19] HOWARD, A., and HOWARD, GABRIELLE L. C., On the inheritance of some characters in wheat. II. Mem. Dept. Agric. India **5**:no. 1. 1912.

[20] ———, On the inheritance of some characters in wheat. II. Mem. Dept. Agric. India **7**:273–285. 1915.

therefore, is 1:4:2:2:1:2:1:2:1. The analysis was carried out on a commendably large scale and gave the following approach to expectation:

	BBTT	*BbTt*	*BbTT*	*BBTt*	*BBtt*	*Bbtt*	*bbTT*	*bbTt*	*bbtt*
Observed.....	16	54	40	33	15	22	13	24	13
Expected.....	15.4	61.6	30.8	30.8	15.4	30.8	15.4	30.8	15.4

It is clear that the results of this analysis will account for the discrepancies in the results of other investigators, since the short awned individuals may be classed on one basis with the awned, or on another basis with the awnless, and would naturally be classed either with the awnless, or as a distinct intermediate class, if a strictly awnless wheat had not been used in the cross.—GEO. H. SHULL.

"Amphiclinous" hybrids.—By this term DE VRIES[21] designates those F_1 hybrid progenies in which a portion of the individuals resemble the one parent, and the remainder resemble the other parent, a type of behavior which is not uncommon among crosses in the species of *Oenothera*. He describes such a cross between *O. Lamarckiana* and *O. Lamarckiana* mut. *nanella*. The percentage of *nanella* among the F_1 offspring of this cross can be modified by the conditions under which the mother plant is grown, from nearly 0 per cent to nearly 100 per cent. When the *Lamarckiana* mother was grown as an annual, the average percentage of *nanella* was 22; and when the *Lamarckiana* was grown as a biennial, the average number of *nanella* among the offspring reached 65 per cent. Corresponding with this result there is also a much higher percentage of *nanella* from capsules developed early in the season, when the mother is in most vigorous condition, than from capsules produced later in the season when vegetative vigor is declining. For example, on 3 different biennial *Lamarckiana* plants used in these extensive crosses, capsules developing July 12–23 yielded 73–88 per cent of *nanella*, those produced between July 24 and August 4 yielded 61–67 per cent *nanella*, and between August 5 and 16 the capsules produced 48–57 per cent *nanella*.

Another experiment showed that the time of transplanting has a marked influence on the percentage of *nanella* offspring, those reset on April 15 yielding 50 per cent, while plants of the same culture set out on May 15 produced only 29 per cent *nanella*. In this case the *Lamarckiana* mothers were grown as annuals. Further experiments showed that keeping the plants well watered also resulted in an increase in the percentage of *nanella* plants among the F_1 progeny.—GEO. H. SHULL.

[21] DE VRIES, H., Über amphikline Bastarde. Ber. Deutsch. Bot. Gesells. **33**:461–468. 1915.